

09/936679

531 Rec'd PCT 14 SEP 2001

F-7158

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ryoichi OKAMOTO et al.
Serial No. : (Not yet known) (PCT/JP01/00198)
Filed : Concurrently
For : DRY DISTILLATION AND VOLUME
REDUCTION APPARATUS FOR WASTE
Group Art Unit : (Not yet known)
Examiner : (Not yet known)

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Preliminary to examination, please amend the above-identified patent application as follows:

IN THE DRAWINGS:

Please find accompanying this response proposed amendments of Figs. 4 and 5, wherein changes are indicated in red, and a Letter to the Draftsman.

IN THE SPECIFICATION:

Please replace indicated paragraphs of the specification with replacement paragraphs presented below. Appendix II is attached hereto having marked versions of said indicated paragraphs with amendments indicated by brackets and underlining.

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Pages 20 and 21, replace the paragraph bridging these pages with the following:

The superheated steam generator 1 comprises the feed pipe 9 for feeding the warm water supplied via a heat exchanger 32 of a rotary engine 31 driving the electric power generator 7, a superheated steam supply pipe 10 for supplying the generated superheated steam to the dry distillation and volume reduction vessel 2, a burner 11 for burning the combustible gas supplied from the heating gas supplier 41, a boiler 33 for producing saturated steam at a temperature of 100°C under normal pressure by heating the warm water supplied from the feed pipe 9 with the exhaust gas of rotary engine 31 and the combustion gas of burner 11, and a superheater 34 for producing a steam superheated under normal pressure to a temperature of, for example, 250-500°C by heating the saturated steam produced in boiler 33.

Pages 21 and 22, replace the paragraph bridging these pages with the following:

The dry distillation and volume reduction vessel 2 pyrolyzes organic waste 51 in a non-oxidizing/reducing manner in an oxygen-free or low-oxygen atmosphere with superheated steam supplied from the superheated steam generator 1 via the superheated steam supply pipe 10, that is, with low-pressure superheated steam under a pressure of no less than the normal pressure which has been superheated under the normal pressure to a temperature, for example, of 250-500°C, and produces carbides 52 and dry distilled gas. The carbides 52 produced in the dry distillation and volume reduction vessel 22 are cooled with a cooler 52 and then at least a portion thereof is supplied to the heating gas supplier 41.

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Page 31, 2nd full paragraph, replace with the following:

Moreover, because in the above-described embodiment incomplete combustion is induced in the heating gas supplier 41 after the addition of waste oil to carbides 52, the utilization of the combustible gas produced by gasification of the waste oil can result in efficient gasification of carbides and substantial increase in thermal energy of the combustible gas supplied, for example, to the superheated steam generator 1.

Pages 32 and 33, replace the paragraph bridging these pages with the following:

FIG. 5 illustrates the third embodiment of the dry distillation and volume reduction apparatus for waste in accordance with the present invention. In this dry distillation and volume reduction apparatus for waste, the superheated steam generator 1, the dry distillation and volume reduction vessel 2, heating gas supplier (not shown), a hopper 43 for charging the waste into the dry distillation and volume reduction vessel 2, and a bucket conveyor 44 for transferring the waste into the hopper 43 are mounted on a load-carrying platform 61 of a vehicle 62 and the dry distillation and volume reduction vessel 2 is disposed above the superheated steam generator 1, thereby integrating the superheated steam generator 1 with the dry distillation and volume reduction vessel 2.

Page 33, 1st full paragraph, replace with the following:

When the dry distillation and volume reduction vessel 2 and the superheated steam generator 1 are integrated by installing the former above the latter, the dry distillation and volume reduction apparatus can have a simple and compact

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configuration. Moreover, since the dry distillation and volume reduction vessel 2 is heated by the heat emanated from the superheated steam generator 1, dry distillation and volume reduction of waste can be implemented with good efficiency. Furthermore, when the superheated steam generator 1, the dry distillation and volume reduction vessel 2, and the heating gas supplier (not shown) are installed on the load-carrying platform 61 of vehicle 62, as described above, the dry distillation and volume reduction apparatus can be very easily transported to any place by the vehicle 62.

IN THE CLAIMS:

Please amend claims 4-20 as shown rewritten below with amendments effected therein. Appendix I is attached hereto having marked versions of said claims with amendments indicated by brackets and underlining.

4. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 3, wherein exhaust gas led out from the superheated steam generator is used as a heat source for heating the hot flow supplier.

5. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 3, wherein high-temperature gas led out from the dry distillation and volume reduction vessel is used as a heat source for heating the hot flow supplier.

6. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 2, wherein the drier includes a rotary drier having an inclined

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rotary cylinder provided with a sweeping blade for sweeping the waste upward and hot flow supplier for supplying a hot flow into the inclined rotary cylinder.

7. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, further comprising a crusher for crushing in advance the waste supplied to the dry distillation and volume reduction vessel.

8. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein the superheated steam generator is provided with a feed tube for warm water led out from the cooling water system of an engine and the superheated steam is generated by heating the warm water passing through the feed tube.

9. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein the superheated steam generator is provided with a burner serving as a heater for the superheated steam generator.

10. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 9, wherein combustible components recovered from the dry distilled gas generated during dry distillation and volume reduction of the waste by the dry distillation and volume reduction vessel are used as a fuel for the burner.

11. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 9, wherein carbides produced during dry distillation and volume reduction of the waste by the dry distillation and volume reduction vessel are supplied into the superheated steam generator and burned by the burner.

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12 (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, further comprising a reflux unit for reusing the superheated steam supplied to the dry distillation and volume reduction vessel as a heat source for heating for the superheated steam generation by refluxing the superheated steam to the superheated steam generator.

13. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein exhaust gases of an engine serving as a driving source of a power generator are used as a heat source for heating the superheated steam generator.

14. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein a portion of superheated steam generated by the superheated steam generator is supplied to a turbine power generator to drive the turbine power generator.

15. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein a low-pressure superheated steam under a pressure of no less than the normal pressure which has been superheated to a temperature of 250 to 500°C under the normal pressure in the superheated steam generator is supplied to the dry distillation and volume reduction vessel and the waste is pyrolyzed in an oxygen-free or low-oxygen atmosphere.

16. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, comprising a separation and recovery unit for separating and recovering useful components from the dry distilled gas produced during dry distillation and volume reduction by the dry distillation and volume reduction vessel.

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17. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1, wherein the superheated steam generator and the dry distillation and volume reduction vessel are integrated.

18. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 1 wherein the superheated steam generator, dry distillation and volume reduction vessel, and heating gas supplier are installed on a vehicle load-carrying platform.

19. (Amended) A dry distillation and volume reduction apparatus for waste, comprising:

- a superheated steam generator for generating a superheated steam;
- a dry distillation and volume reduction vessel for heating and subjecting the organic waste to dry distillation and volume reduction using the superheated steam supplied from the superheated steam generator; and
- a heating gas supplier for supplying combustible gas generated by incomplete combustion of carbides produced in the dry distillation and volume reduction vessel as a heat source for heating the superheated steam generator.

20. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 19, wherein waste oil is added to the carbides to induce the incomplete combustion.

Please add the following claims:

-- 21. The dry distillation and volume reduction apparatus for waste according to claim 19, wherein a low-pressure superheated steam under a pressure

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of no less than the normal pressure which has been superheated to a temperature of 250 to 500°C under the normal pressure in the superheated steam generator is supplied to the dry distillation and volume reduction vessel and the waste is pyrolyzed in an oxygen-free or low-oxygen atmosphere.

22. The dry distillation and volume reduction apparatus for waste according to claim 19, comprising a separation and recovery unit for separating and recovering useful components from the dry distilled gas produced during dry distillation and volume reduction by the dry distillation and volume reduction vessel.

23. The dry distillation and volume reduction apparatus for waste according to claim 19, wherein the superheated steam generator and the dry distillation and volume reduction vessel are integrated.

24. The dry distillation and volume reduction apparatus for waste according to claim 19, wherein the superheated steam generator, dry distillation and volume reduction vessel, and heating gas supplier are installed on a vehicle load-carrying platform. - -

REMARKS

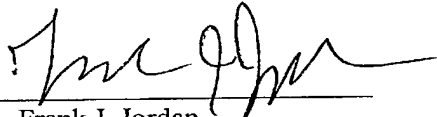
Claims 1-24 are pending in this application and are intended for examination. Please amend the specification, drawings and claims as indicated.

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In light of the foregoing, it is respectfully submitted that the application is in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,

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APPENDIX I

AMENDED CLAIMS WITH AMENDMENTS INDICATED THEREIN
BY BRACKETS AND UNDERLINING

4. (Amended) The dry distillation and volume reduction apparatus for waste according to claim [2] 3, wherein [the drier includes a rotary drier having an inclined rotary cylinder provided with a sweeping blade for sweeping the waste upward and hot flow supplier for supplying a hot flow into the inclined rotary cylinder] exhaust gas led out from the superheated steam generator is used as a heat source for heating the hot flow supplier.

5. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 3 [or 4], wherein [exhaust] high-temperature gas led out from the [superheated steam generator] dry distillation and volume reduction vessel is used as a heat source for heating the hot flow supplier.

6. (Amended) The dry distillation and volume reduction apparatus for waste according to claim [3 or 4] 2, wherein [high-temperature gas led out from the dry distillation and volume reduction vessel is used as a heat source for heating of the] the drier includes a rotary drier having an inclined rotary cylinder provided with a

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sweeping blade for sweeping the waste upward and hot flow supplier for supplying a hot flow into the inclined rotary cylinder.

7. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 6], further comprising a crusher for crushing in advance the waste supplied to the dry distillation and volume reduction vessel.

8. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 7], wherein the superheated steam generator is provided with a feed tube for warm water led out from the cooling water system of an engine and the superheated steam is generated by heating the warm water passing through the feed tube.

9. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 8], wherein the superheated steam generator is provided with a burner serving as a heater for the superheated steam generator.

10. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims 1 to] claim 9, [further comprising a reflux unit for reusing the superheated steam supplied to] wherein combustible components recovered from the dry distilled gas generated during dry distillation and volume

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reduction [vessel as a heat source for heating for the superheated steam generation by refluxing the superheated steam to the superheated steam generator] of the waste by the dry distillation and volume reduction vessel are used as a fuel for the burner.

11. (Amended) The dry distillation and volume reduction apparatus for waste according to claim 9 [or 10], wherein [combustible components recovered from the dry distilled gas generated] carbides produced during dry distillation and volume reduction of the waste by the dry distillation and volume reduction vessel are [used as a fuel for] supplied into the superheated steam generator and burned by the burner.

12 (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims 9 to 11] claim 1, [wherein carbides produced during] further comprising a reflux unit for reusing the superheated steam supplied to the dry distillation and volume reduction [of the waste by the dry distillation and volume reduction] vessel [are supplied into] as a heat source for heating for the superheated steam generation by refluxing the superheated steam to the superheated steam generator [and burned by the burner].

13. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 12], wherein exhaust gases of an

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engine serving as a driving source of a power generator are used as a heat source for heating the superheated steam generator.

14. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 13], wherein a portion of superheated steam generated by the superheated steam generator is supplied to a turbine power generator to drive the turbine power generator.

15. (Amended) The [A] dry distillation and volume reduction apparatus for waste [, comprising:

a superheated steam generator for generating a superheated steam;

a dry distillation and volume reduction vessel for heating and subjecting the organic waste to dry distillation and volume reduction using the superheated steam supplied from the superheated steam generator; and

a heating gas supplier for supplying combustible gas generated by incomplete combustion of carbides produced in] according to claim 1, wherein a low-pressure superheated steam under a pressure of no less than the normal pressure which has been superheated to a temperature of 250 to 500°C under the normal pressure in the superheated steam generator is supplied to the dry distillation and volume reduction vessel [as a heat source for heating the superheated steam generator] and the waste is pyrolyzed in an oxygen-free or low-oxygen atmosphere.

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16. (Amended) The dry distillation and volume reduction apparatus for waste according to claim [15, wherein waste oil is added to the carbides to induce the incomplete combustion] 1, comprising a separation and recovery unit for separating and recovering useful components from the dry distilled gas produced during dry distillation and volume reduction by the dry distillation and volume reduction vessel.

17. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 16], wherein [a low-pressure superheated steam under a pressure of no less than the normal pressure which has been superheated to a temperature of 250 to 500°C under the normal pressure in] the superheated steam generator [is supplied to the dry distillation and volume reduction vessel and the waste is pyrolyzed in an oxygen-free or low-oxygen atmosphere] and the dry distillation and volume reduction vessel are integrated.

18. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims] claim 1 [to 17, comprising a separation and recovery unit for separating and recovering useful components from the dry distilled gas produced during dry distillation and volume reduction by the] wherein the superheated steam generator, dry distillation and volume reduction vessel, and heating gas supplier are installed on a vehicle load-carrying platform.

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19. (Amended) [The] A dry distillation and volume reduction apparatus for waste, comprising: [according to any of claims 1 to 18, wherein the]

a superheated steam generator for generating a superheated steam;

a [and the] dry distillation and volume reduction vessel [are integrated] for heating and subjecting the organic waste to dry distillation and volume reduction using the superheated steam supplied from the superheated steam generator; and

a heating gas supplier for supplying combustible gas generated by incomplete combustion of carbides produced in the dry distillation and volume reduction vessel as a heat source for heating the superheated steam generator.

20. (Amended) The dry distillation and volume reduction apparatus for waste according to [any of claims 1 to 18] claim 19, wherein [the superheated steam generator, dry distillation and volume reduction vessel, and heating gas supplier are installed on a vehicle load-carrying platform] waste oil is added to the carbides to induce the incomplete combustion.

APPENDIX II

AMENDED SPECIFICATION PARAGRAPHS WITH AMENDMENTS
INDICATED THEREIN BY BRACKETS AND UNDERLINING

Pages 20 and 21, replace the paragraph bridging these pages with the following:

The superheated steam generator 1 comprises the feed pipe 9 for feeding the warm water supplied via a heat exchanger 32 of a rotary engine 31 driving the electric power generator 7, a superheated steam supply pipe 10 for supplying the generated superheated steam to the dry distillation and volume reduction vessel 2, a burner 11 for burning the combustible gas supplied from the heating gas supplier 41, a boiler [31] 33 for producing saturated steam at a temperature of 100°C under normal pressure by heating the warm water supplied from the feed pipe 9 with the exhaust gas of rotary engine 31 and the combustion gas of burner 11, and a superheater 34 for producing a steam superheated under normal pressure to a temperature of, for example, 250-500°C by heating the saturated steam produced in boiler 33.

Pages 21 and 22, replace the paragraph bridging these pages with the following:

The dry distillation and volume reduction vessel 2 pyrolyzes organic waste 51 in a non-oxidizing/reducing manner in an oxygen-free or low-oxygen atmosphere with superheated steam supplied from the superheated steam generator 1 via the superheated steam supply pipe 10, that is, with low-pressure superheated steam under a pressure of no less than the normal pressure which has been superheated under the normal pressure to a temperature, for example, of 250-

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500°C, and produces carbides 52 and dry distilled gas. The carbides 52 produced in the dry distillation and volume reduction vessel 22 are cooled with a cooler 52 and then at least a portion thereof is supplied to the heating gas [generator] supplier 41.

Page 31, 2nd full paragraph, replace with the following:

Moreover, because in the above-described embodiment incomplete combustion is induced in the heating gas supplier 41 after the addition of waste oil to carbides [51] 52, the utilization of the combustible gas produced by gasification of the waste oil can result in efficient gasification of carbides and substantial increase in thermal energy of the combustible gas supplied, for example, to the superheated steam generator 1.

Pages 32 and 33, replace the paragraph bridging these pages with the following:

FIG. 5 illustrates the third embodiment of the dry distillation and volume reduction apparatus for waste in accordance with the present invention. In this dry distillation and volume reduction apparatus for waste, the superheated steam generator 1, the dry distillation and volume reduction vessel 2, heating gas supplier (not shown), a hopper 43 for charging the waste into the dry distillation and volume reduction vessel 2, and a bucket conveyor 44 for transferring the waste into the hopper 43 are mounted on a load-carrying platform 61 of a vehicle [6] 62 and the dry distillation and volume reduction vessel 2 is disposed above the superheated steam generator 1, thereby integrating the superheated steam generator 1 with the dry distillation and volume reduction vessel 2.

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Page 33, 1st full paragraph, replace with the following:

When the dry distillation and volume reduction vessel 2 and the superheated steam generator 1 are integrated by installing the former above the latter, the dry distillation and volume reduction apparatus can have a simple and compact configuration. Moreover, since the dry distillation and volume reduction vessel 2 is heated by the heat emanated from the superheated steam generator 1, dry distillation and volume reduction of waste can be implemented with good efficiency. Furthermore, when the superheated steam generator 1, the dry distillation and volume reduction vessel 2, and the heating gas supplier (not shown) are installed on the load-carrying platform 61 of vehicle [6] 62, as described above, the dry distillation and volume reduction apparatus can be very easily transported to any place by the vehicle [6] 62.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No. : (Not yet known) (PCT / JP 01 / 00 198)
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REDUCTION APPARATUS FOR WASTE
Group Art Unit : (Not yet known)
Examiner : (Not yet known)

Assistant Commissioner for Patents
Washington, D.C. 20231

LETTER TO DRAFTSMAN

Sir:

Please find accompanying this letter copies of Figs. 4 and 5, wherein proposed changes have been marked in red. These submissions are made pursuant to MPEP §608.02(r) "Separate Letter To Draftsman." Applicant elects to await issuance of a notice of allowance prior to submitting substitute drawings.

Respectfully submitted,
Jordan and Hamburg LLP

By



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FIG. 4

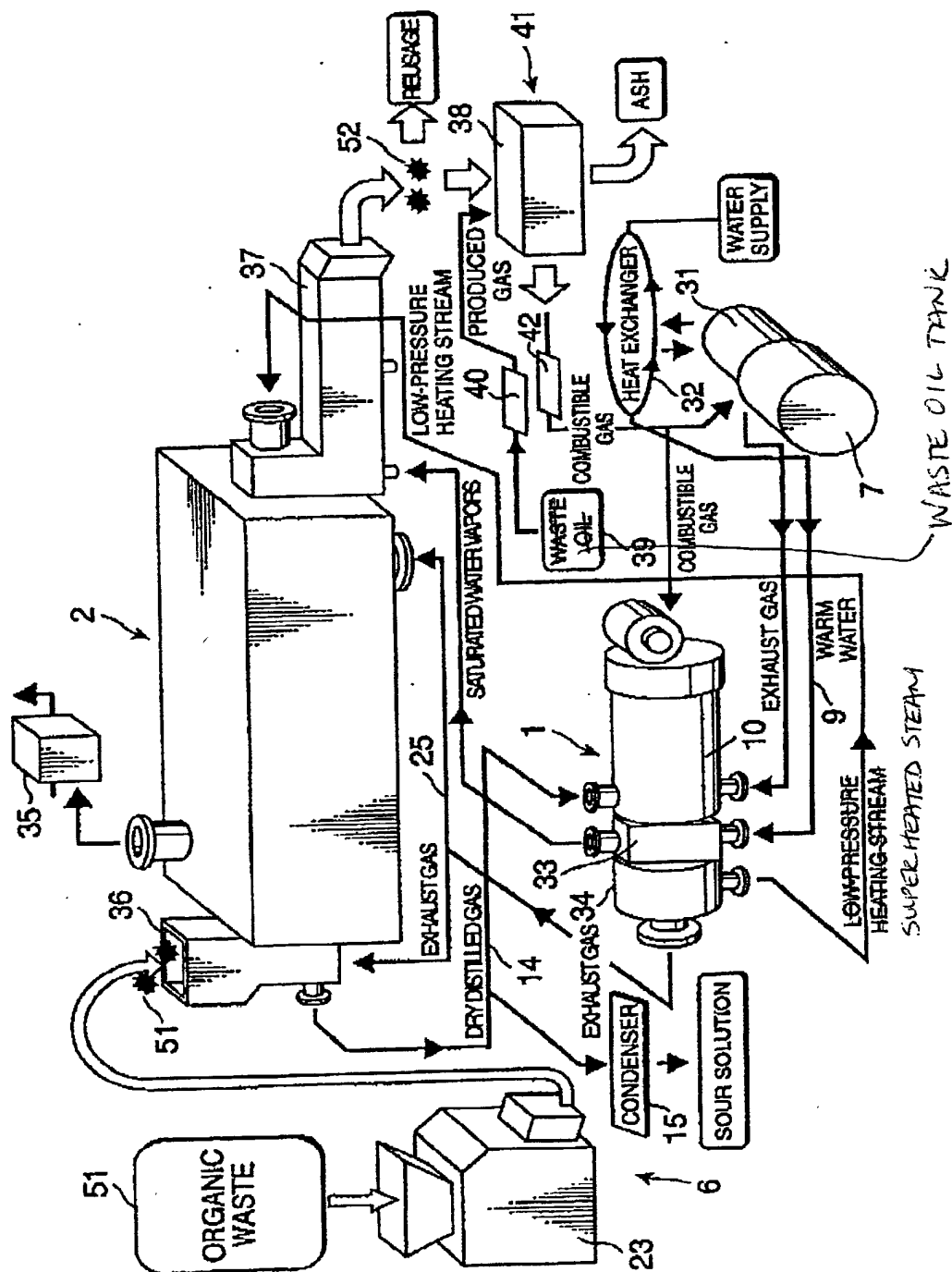


FIG. 5

